

FIRE NOZZLE OPERATING TORQUE TESTER



Fire Nozzle Operating Torque Tester - ToronFT™ FN-OT

ToronFT™ FN-OT is a fire nozzle operating torque tester designed to accurately measure the operating torque required to switch a fire nozzle from the fully closed position to the fully open position under rated injection pressure. Measuring operating torque is a key quality and safety parameter for fire nozzles — if the torque required to operate the nozzle switch is too high, firefighters cannot quickly open the nozzle during an emergency, while insufficient torque resistance may allow inadvertent actuation. The ToronFT™ FN-OT provides a standardized, traceable measurement of this critical performance parameter for fire nozzle qualification, production quality control, and compliance testing programs.

The instrument measures operating torque across a range of 1.25 to 25 N·m with a resolution of 0.001 N·m and measurement error of ± 0.3 N·m. A peak lock function captures and holds the maximum torque value recorded during the test cycle — the most operationally relevant measurement for fire nozzle operating torque evaluation. A set of connecting fixtures is included as standard for attaching the fire nozzle to the apparatus.

APPLICATIONS

Fire Nozzle Operating Torque Tester - ToronFT™ FN-OT Applications

The ToronFT™ FN-OT fire nozzle operating torque tester is used across fire nozzle manufacturing, certification testing, and quality assurance programs:

- Fire nozzle type approval testing: operating torque measurement as part of a complete fire nozzle performance qualification program to NFPA and international standards
- Production quality control: batch-level torque verification of fire nozzles to confirm switch operating force is within specification before shipment
- Fire nozzle design development: torque characterization of new fire nozzle designs, valve mechanisms, and seal formulations during product development

- Third-party certification testing: standardized operating torque measurement for fire nozzle listings and approvals under UL, FM, and international certification programs
- Incoming inspection: torque verification of fire nozzles received from suppliers to confirm compliance with purchase specification requirements
- Fire equipment testing laboratories: standardized fire nozzle torque test capability as part of a comprehensive fire safety equipment test facility



FEATURES

Fire Nozzle Operating Torque Tester - ToronFT™ FN-OT Key Features

1. Operating Torque Measurement Range — 1.25 to 25 N·m

The measurement range of 1.25 to 25 N·m covers the full spectrum of operating torque values encountered in fire nozzle switch actuation testing across different nozzle sizes, designs, and pressure ratings — from small handline nozzles to large-flow master stream devices.

2. High Resolution — 0.001 N·m

A measurement resolution of 0.001 N·m enables the instrument to detect fine differences in nozzle switch operating torque across the full measurement range, supporting precise product development characterization and tight production quality control tolerances.

3. Measurement Error — ± 0.3 N·m

The measurement error of ± 0.3 N·m provides the accuracy level needed for compliance testing against fire nozzle operating torque acceptance criteria in NFPA, UL, and international fire safety standards.

4. Peak Lock Function

The peak lock function captures and holds the maximum torque value recorded during the nozzle switch rotation arc from closed to fully open. This peak value — the worst-case operating force the firefighter must overcome — is the primary acceptance criterion for fire nozzle operating torque compliance testing.

5. Complete Connecting Fixture Set Included

A set of connecting fixtures is included as standard, providing the necessary adapters and clamps for securing fire nozzles of different thread types and sizes to the tester for immediate testing without additional tooling.

6. Rated Pressure Test Condition

The fire nozzle is tested at its rated injection pressure — the actual operating condition — ensuring that the measured switching torque reflects the real-world force that a firefighter must apply during fire suppression operations.

THEORY & METHOD

Theory and Method

The ToronFT™ FN-OT measures fire nozzle operating torque by placing the fire nozzle on the tester, closing the nozzle switch, and pressurizing the fire nozzle to the rated injection pressure through the connected hydraulic system. With the nozzle pressurized, the operator manually rotates the nozzle switch from the fully closed position to the fully open position using the instrument's force-distance measuring system. The torque applied to the nozzle switch is measured continuously throughout the travel arc from closed to fully open.

The force-distance measuring instrument records the applied torque at each point during the switch rotation arc. The peak lock function captures and displays the maximum torque value observed during the full open-to-close or close-to-open switching arc — representing the worst-case operating force that a firefighter would need to apply to actuate the nozzle under rated pressure. This peak torque value is the critical measurement compared against acceptance criteria in applicable fire nozzle performance standards. The measurement system is calibrated to an accuracy of ± 0.3 N·m with a resolution of 0.001 N·m throughout the 1.25–25 N·m measurement range.

TECHNICAL SPECIFICATIONS

Fire Nozzle Operating Torque Tester - ToronFT™ FN-OT Technical Specifications

Parameter	Specification
Model	ToronFT™ FN-OT
Application	Operating torque measurement of fire nozzle switches under rated injection pressure
Measuring Range	1.25 – 25 N·m
Resolution	0.001 N·m
Measurement Error	±0.3 N·m
Peak Lock Function	Yes (captures and holds maximum torque value)
Connecting Fixtures	One complete set (included as standard)
Test Condition	Fire nozzle pressurized to rated injection pressure
Standards Compliance	NFPA 1964, UL 385, EN 15182-1, EN 15182-2



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